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## **Original Article**

### **Participation in bowel screening amongst men attending abdominal aortic aneurysm screening.**

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Tweet: Improving bowel cancer screening uptake in men attending AAA screening

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## **Abstract**

### **Background**

Uptake of population-based screening for colorectal cancer (CRC) in Scotland is around 55%. Abdominal aortic aneurysm (AAA) screening has recently been introduced for men aged 65 years and the reported uptake is 79%. Our aim was to determine the impact of a brief intervention on bowel screening in men who attended AAA screening but previously failed to complete bowel screening.

### **Methods**

Men invited for AAA screening between September 2015 and March 2016 within NHS Tayside were included. Attendees who had not responded to their latest bowel screening invitation were seen by CRC clinical nurse specialists. Reasons for not completing the faecal occult blood test (FOBT) were recorded, brief information on CRC screening was communicated and participants were offered a further invitation to complete a FOBT. Those who responded positively were sent a further FOBT from the Scottish Bowel Screening Centre. Subsequent return of a completed FOBT within six months was recorded.

### **Results**

556 men attended for AAA screening of whom 23.6% had not completed recent FOBT. The primary reason stated for not participating was the time taken to complete the test and overlooking it (35.1%). Other reasons included lack of motivation (23.4%), confusion regarding the aim of screening (16.2%), disgust (19.8%), fear (6.3%) and other health problems (9.9%). Following discussion, 81.1% agreed to complete the FOBT and 48.8% then returned the test.

### **Conclusion**

A substantial proportion of previous bowel screening non-responders subsequently returned a completed FOBT following a brief intervention with a nurse specialist. Attendance at non-bowel screening appointments may provide valuable opportunities to improve bowel screening uptake.

## Introduction

Colorectal (bowel) cancer is the fourth most common cause of cancer death worldwide and the second most common in the UK.<sup>1</sup> Biennial screening can reduce mortality by up to 27% in those people undertaking screening.<sup>2-5</sup> The Scottish Bowel Screening Programme (SBoSP) was introduced in 2007 following three pilot screening rounds which commenced in 2000.<sup>7</sup> The SBoSP invites all men and women between the age of 50 and 74 years to participate every two years.

The overall SBoSP uptake has been just over 55%<sup>6, 7</sup>. Men, younger adults, those living in higher areas of deprivation and ethnic minority groups are less likely to engage in screening.<sup>6,8</sup> Proposed explanations for low uptake in these groups include lack of literacy, stress, low social support and competing life demands.<sup>8</sup>

Population abdominal aortic aneurysm (AAA) screening for 65 year old men by a single ultrasound was recommended by the UK National Screening Committee in 2007.<sup>9</sup> Reported uptake in this traditionally resistant to screening male group, has been between 88 and 90%.<sup>10, 11</sup> In comparison, uptake of bowel screening in the 65-69 year old age group is only 55% in Scotland.<sup>12</sup>

The general public perceive health professionals as experts in matters relating to disease prevention and management. Thus, individual communication on behaviour change may help endorse the messages of public health campaigns and improve uptake of screening. The primary aim of this study was to determine what effect a brief intervention by a health professional in the context of AAA screening could have on bowel screening uptake.

## Methods

All men aged 65 years registered with a NHS Tayside general practitioner were invited by standard letter to attend a local community setting for a one-off abdominal ultrasound scan as part of the AAA screening programme in Scotland. Ultrasound imaging was performed by dedicated screeners trained to image the infra-renal aorta. All participants invited between September 2015 and March 2016 were included in the analysis.

Those who attended for AAA screening, but had not returned their last bowel screening faecal occult blood test (FOBT), were invited for interview by clinical nurse specialists (CNS) immediately after completion of the AAA screening specifically to discuss bowel screening. Men in whom the screening ultrasound had detected an aneurysm were not approached. On agreeing to interview, respondents were asked about symptoms, previous participation with bowel screening and reasons for not completing the FOBT. All questions, which were phrased in a non-judgmental fashion, were read out and free text responses recorded or recorded in pre-defined categories. Participants could volunteer multiple reasons for their non-completion. A brief intervention on the purpose of bowel screening, advice on how to complete the FOBT and an invitation to complete a new FOBT was then provided. A FOBT was then issued within two weeks by the Scottish Bowel Screening Centre to those who requested it. Non-return of a completed FOBT within six months was classified a non-response. No further attempt to contact participants following interview was made.

Deprivation category was calculated using the population weighted Scottish Index of Multiple Deprivation 2012 (SIMD) quintiles.<sup>13</sup> Quintiles of deprivation were used to assign individuals a relative deprivation category based on their postcode at the time of invitation with the first quintile representing the most deprived and the fifth quintile the least deprived.

On the advice of the chair of the local ethics committee, the Health Research Authority's guidance on defining research (<http://www.hra.nhs.uk/documents/2016/06/defining-research.pdf>),<sup>14</sup> was consulted and the work described clearly fell into the category of service development and not research; it should be noted that this guidance allows for the administration of a questionnaire or interview. Research Ethical Committee review was therefore not sought. The work was approved by the Tayside Bowel Screening Committee

## Results

In total, 556 men were invited for AAA screening. Overall uptake of AAA screening was 84.9% (n = 472). The reported FOBT uptake within attendees was 62.2% for the last round in which they were invited (Table 1). Previous screening history was obtained from the screening database maintained by the Scottish Bowel Screening Centre. Amongst the 84 men who did not attend for AAA screening, only three had completed their most recent bowel screening. Of those attending AAA screening 131 (27.7%) had not completed their most recent bowel screening with 103 (78.6%) having never completed a FOBT. Of these, 111 (84.7%) men agreed to being seen by the CNS with 90 (81.1%) participants agreeing to receive a further screening FOBT. Of those agreeing, 44 (48.9%) subsequently returned a completed FOBT (Figure 1).

The number of latest SBoSP round non-responders was higher in those from the most as compared to the least deprived areas (24.1% SIMD 1 vs 11.8% SIMD 5). Acceptance to be interviewed and then willingness to be sent another FOBT was similar across the deprivation spectrum (Table 1). Following interview, 44 (39.6%) of previous non-responders completed a FOBT with response rates of 52.4%, 61.5%, 41.6% and 72.5% in SIMD 1, 2, 4 and 5 respectively. Participants from SIMD 3 had the lowest completion rate of 33.3% (Figure 2).

In total, the final uptake of FOBT screening in those who attended for AAA screening went up from 341/472 (72.3%) to 385/472 (81.6%), a relative increase of 14.0% and an absolute increase of 9.3%.

The most frequent reason stated for not participating in bowel screening was the time taken to complete the test with many forgetting to complete it (35.1%; Table 2). Lack of motivation was the second most common reason cited for not participating (23.4%). Other reasons included confusion regarding the purpose of the screening test (16.2%), disgust (19.8%), fear of the result (6.3%) and other health problems (9.9%).

Following interview, men in all categories returned FOBTs, but the proportions who did so was variable (Table 2).

## Discussion

This work has demonstrated the positive impact a brief health professional intervention can have in improving bowel screening uptake within a group with traditionally low uptake within another screening setting. The most common reason volunteered for not completing a FOBT was the time taken to perform the test. With reinforcement of the benefits and some instruction how to complete the one third of previous non-responders completed the test. These results compares favourably to other strategies that have been employed to improve screening uptake.<sup>15, 16</sup> It would be of interest to study the effect on men invited for AAA screening of the introduction of the simpler, single sample faecal immunochemical test for haemoglobin (FIT) when this is introduced to the SBoSP in late 2017, since it is known that the introduction of FIT is associated with is increased screening uptake.<sup>17</sup>

Reducing socioeconomic inequalities in cancer mortality is a priority worldwide. Cancer screening is a major component of efforts to bring forward diagnosis to earlier, more treatable stages but even in the UK, where screening incurs no financial cost to the individual, uptake declines with increasing socioeconomic deprivation.<sup>17-20</sup> People from deprived backgrounds are likely to be struggling with multiple social and economic challenges, making it difficult for them to prioritise participation in cancer screening programmes.<sup>18</sup> These issues cannot be simply addressed by minor variations in the format of the screening invitation. However, the goal of a screening programme should not only be to ensure distribution of the screening invitation to all eligible adults, but also to take every opportunity to reduce inequalities.

Among the factors reported to account for lower than desirable levels of bowel screening, the barriers perceived and encountered by those invited figure prominently. These include the failure of health care professionals to recommend screening, gaps in knowledge, fear, embarrassment, pain, and a lack of symptoms.<sup>21</sup> This list of barriers, while useful, is limited in several respects. Studies have directly asked invitees to describe barriers, with many studies only including those without any prior health screening. One strength of this study is that it focuses on male bowel screening non-responders, who are otherwise engaged in health enhancement by attending AAA screening, and so represent a small but difficult to engage subset of the population. Through an open question interview, it was found that the time taken to complete or the inability to schedule the completion of the FOBT was the main barrier group. This finding is supported by results of studies that have suggested that bowel screening by a single sample FIT, as opposed to the two samples from three separate bowel



motions required for FOBT, will lead to a significant increase in uptake across the deprivation gradient.<sup>17</sup>

FOBT, considered simple by, was often described as confusing, with many harbouring misconceptions. In another open-ended survey, the absence of symptoms ranked among the top ten reasons for not engaging with screening, with others suggesting that those without a family history of bowel cancer need not be screened.<sup>19</sup> Lack of awareness and inadequate knowledge and information are frequently documented as barriers to screening. Efforts to educate the population about bowel cancer and promotion of screening among those eligible have formed the cornerstone of awareness campaigns. The current data suggest, however, that merely advising people to participate in screening may not satisfy their information needs. The central role of advice from health professionals is supported in the literature,<sup>20</sup> which identifies such advice as a key motivator for participation in FOBT screening.

Individual risk is associated with age, sex and deprivation, with those in the most deprived groups having a 20% greater incidence of CRC compared with those in the least deprived.<sup>22</sup> Importantly, it was observed that one of the largest increases in uptake following the current intervention was observed within those from the most deprived areas. Cancer fatalism is more prevalent in groups with low than with high socioeconomic status, and this has been associated with delayed diagnosis.<sup>18</sup> Negative attitudes are not easily modified with simple written materials and it was interesting to note that 66.6% of those who described fear as a reason for non-participation and who agreed to be sent a further FOBT following interview, have since completed it. Responses for perceived barriers are known to differ by gender. In open-ended responses, women were more likely to cite fear as a barrier, whereas men were more likely to cite lack of knowledge<sup>19</sup> which may account for why fear seemed to be under-reported (6.3%) in this study.

Other barriers were assessed, including the well-established sense of disgust associated with completing the FOBT, but only 19.8% identified this as a reason for not completing the test. Interestingly, although only 31.8% of men who described disgust as a barrier agreed to be sent a further FOBT, all subsequently completed it. It is also interesting to note that although 35.1% described the time required to do the test as a barrier, all had found time to come for AAA screening. While it is possible that this may have been only part of the explanation, it is equally possible that finding time to do a faecal test, given that defaecation is not usually a planned event, is more challenging than attending for a scheduled appointment.

The study has several limitations. All participants were recruited from those attending for AAA screening and were, by definition, all men aged 65 years who were engaging with health screening. The application of this approach to the overall population invited for bowel screening is therefore limited. In addition, a substantial proportion (38.2%) of bowel screening non-responders identified during our study also chose not to attend AAA screening and could not, therefore, be included in our analysis. Those non-responders who did attend, however, represent a hard to reach sub-group of the population who may benefit most from bowel screening as they have a high risk of pathology and the FOBT has a high positive predictive value in men of this age<sup>21</sup>. This is the first study to assess this specific group and this is a major strength of the paper. While it was not a randomised study, no other component of the SBoSP changed between the first and second years of the third screening round. It is therefore very unlikely that uptake could have been affected by any other variable. A further strength was that the intervention had equal impact across the deprivation spectrum.

Thus, this study demonstrates that a brief intervention, if delivered at an opportune time, can improve uptake in participation in bowel screening across the deprivation gradient. Recent initiatives in the United Kingdom such as the “health promoting health service” and “every contact counts” may provide opportunities to enhance uptake in screening and prevention programmes.<sup>23</sup> There is widespread recognition that health promotion is central to the provision of healthcare and the potential for healthcare systems (including hospitals and clinics) to promote appropriate screening programmes is clear.

In summary, it has been shown that significantly more men aged 65 years engage with AAA screening than bowel screening and that, using the contact through AAA screening, bowel screening uptake can be improved by almost 10%. Although employing dedicated staff to provide the short face-to-face endorsement and explanation necessary to achieve this outcome would make a national intervention expensive, it is conceivable that an effective intervention could be delivered by AAA screening staff at little extra cost.

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	Study Cohort Screening History			Intervention Group		
	No FOBT/ No AAA (%)	Last round FOBT non-respond (%)	Never FOBT (%)	Agreed to Interview (%)	Further FOBT requested (%)	Completed FOBT (%)
SIMD 1	23 (28.3)	51 (24.1)	43 (23.9)	25(86.2)	21 (84.0)	11 (52.4)
SIMD 2	12 (14.8)	35 (16.5)	30 (16.7)	15 (71.4)	13 (86.7)	8 (61.5)
SIMD 3	9 (11.1)	38 (17.9)	33 (18.3)	27 (90.0)	21 (77.8)	7 (33.3)
SIMD 4	29 (35.8)	63 (29.7)	55 (30.5)	31 (91.2)	24 (77.4)	10 (41.7)
SIMD 5	8 (9.9)	25 (11.8)	19 (10.6)	13 (81.2)	11 (84.6)	8 (72.7)
Total	81	212	180	111	90	44

Table 1 Participant bowel screening participation history and deprivation category. No FOBT/No AAA are those participants who had not completed FOBT and did not attend AAA screening. Last round FOBT non responders are those participants who have previously completed FOBT but did not complete the last round and Never FOBT are participants who have never completed a FOBT.

Reason for not completing FOBT (n = 111)	Total (%)	Further FOBT requested (%)	Completed (%)
Time required	39 (35.1)	35 (89.7)	12 (30.7)
No motivation	26(23.4)	22 (84.6)	12 (46.2)
Confusion	18 (16.2)	13 (72.2)	8 (44.4)
Disgust	22 (19.8)	7 (31.8)	7 (31.8)
Fear	7 (6.3)	3 (42.9)	2 (28.6)
Other health issue	11(9.9)	6 (54.5)	6 (54.5)
Incorrect address	7 (6.3)	5 (71.4)	5 (71.4)

Table 2. Reasons provided for not completing bowel screening with a faecal occult blood test (FOBT) and number agreeing to receive a further FOBT (% of total) with number (% of total) who completed the further FOBT. Study participants could volunteer multiple reasons.

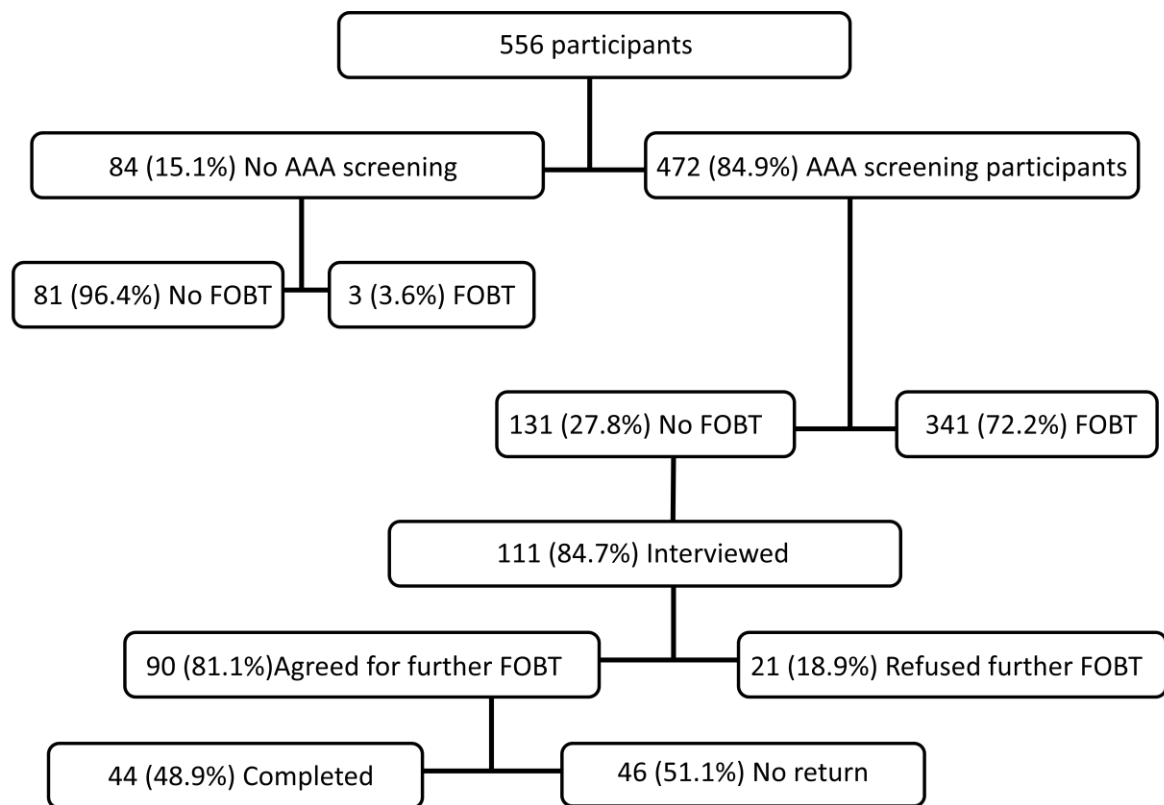


Figure 1. Study flow diagram

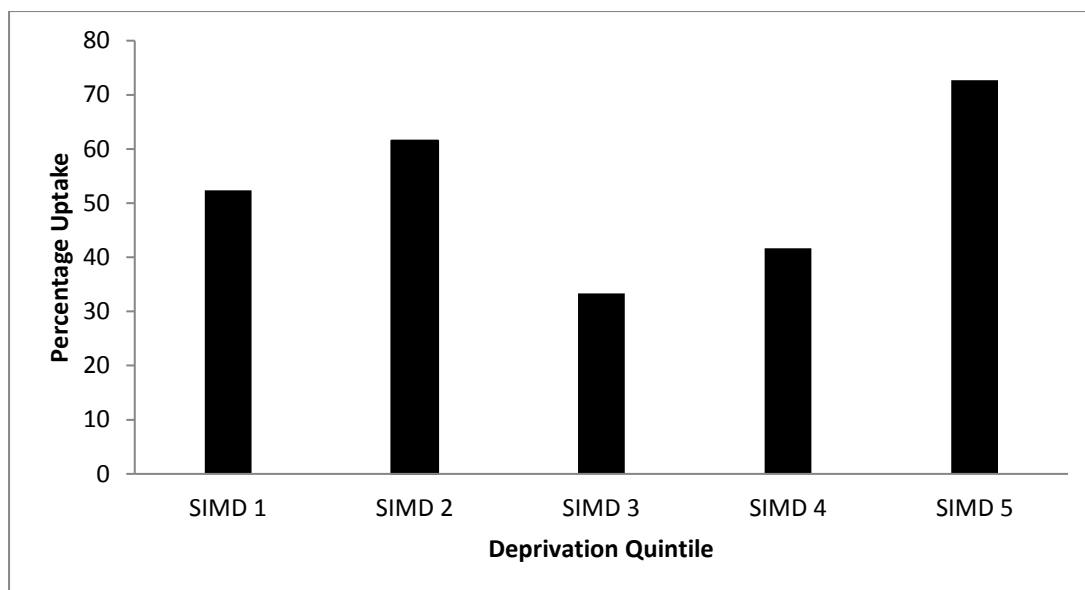


Figure 2. Uptake of bowel screening amongst previous non-responders following specialist nurse interview and education.